

PEI Water Act Consultation

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Outline of Presentation

Topics

- Groundwater on PEI
- Current Legislation / Regulations
- Commitment to Enforcement
- Watershed Models / Water Budget
- Water Quantity and Extraction
- Groundwater Quality and Protection
- Public Education
- Storm water Management
- Summary

Bubbling Spring



Groundwater on PEI

- Our geological setting: mainly sandy overburden and fractured sandstone bedrock.
- Groundwater is our only source of fresh water for human, animal, plant consumption, processing and other uses
- Average annual precipitation of 1158 mm @ Ch'town
 - Rain: 887 mm ; Snow: 290 cm (30 year normal up to 2010)
- K. MacQuarrie suggests a range from 250 to 450 mm per year = 20 to 40% of total precipitation
- R. Francis in his comprehensive assessment of the Winter River watershed (1989) suggests the recharge rate in this watershed is 42% and could be as high as 58% in some upper areas of the watershed. 42% = 486mm /y
- Highest well yields are in the upper zone (0-100 metres) more highly fractured zone of the aquifer.
- The commonly used term of “Deep Water Wells” is a misnomer.
- More intense precipitation events are forecast in the coming years with total rainfall events expected to decrease slightly in the next 50 years then rising slightly towards the end of the current century. (Fenech)
- Summers are also predicted to be dryer with some occurrences of drought
- Our groundwater is highly vulnerable to surface sources of contamination

Highly Weathered Sandstone Bedrock at Rocky Point



Water Table Close to Surface at Argyle Shore



Artesian Well at St. Andrew's



Pure clean drinking water is what all Islanders want!

Water Quality Factors to Consider

- Surface water – bacterial, dissolved solids etc;
- Sewage / processing water discharge;
- Surface and subsurface disposal of solid and liquid waste materials;
- Petroleum spill and leaks;
- Agricultural: manure, fertilizer, nutrients, pesticides, liquid effluent, waste disposal; and
- Transportation: road salt, de-icing agents and spills, etc.

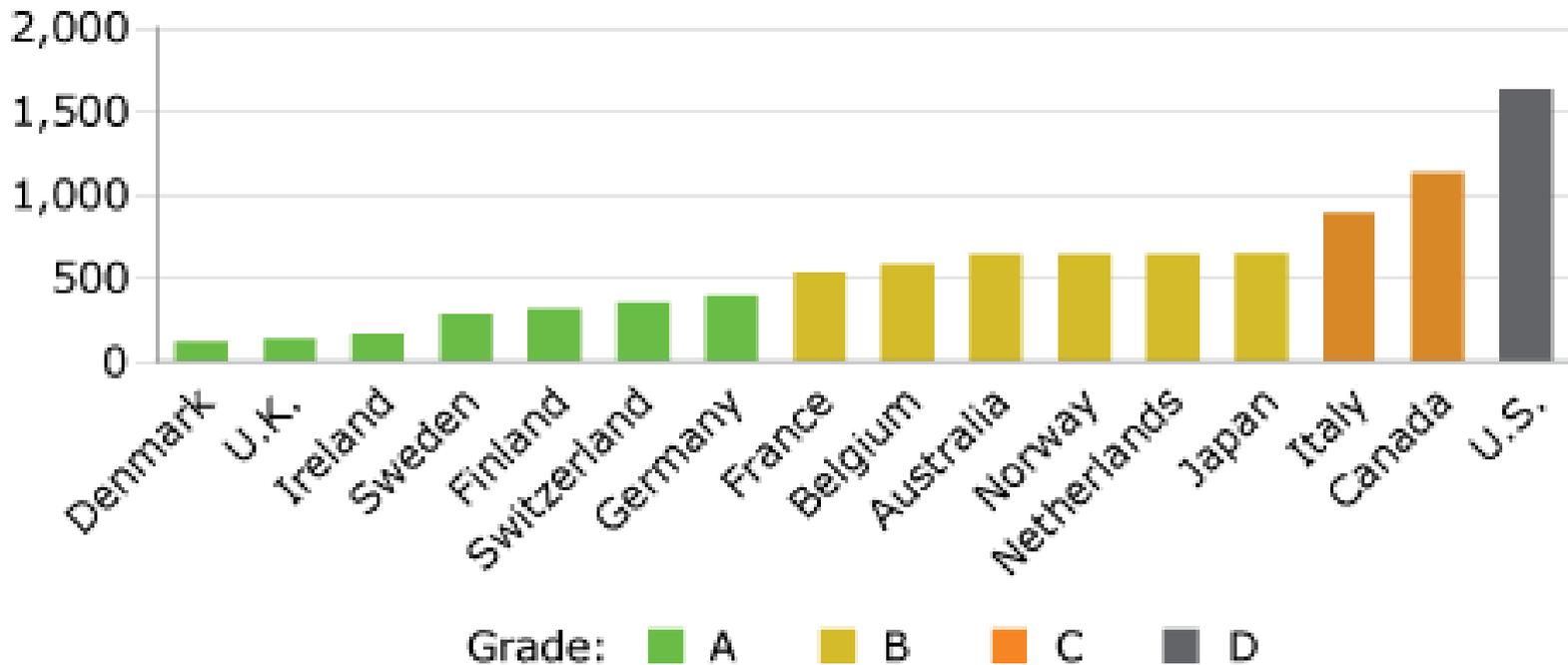
Water Quantity Factors to Consider

- Well yields may vary seasonally
- Pumping rates for crop irrigation should be adjusted to compensate for the times when the water table is at its lowest.
- Distance of well from streams and other wells is also an important factor.
- Well construction and casing installation are important
- Water conservation measures must be enhanced.

Canadian Water Consumption

Source: Conference Board of Canada

Water Withdrawals, 2009 or Most Recent Year
(cubic metres per capita)



Canadian water consumption is excessive. Water conservation measures must be increased and enhanced. A 25% reduction would make a huge difference!

Groundwater & Current Legislation

- Environmental Protection Act
 - Section 9 on Environmental Impact
 - Section 12 on wells
 - Section 13 on Bulk Water Removal
 - Section 20 on Discharge of Contaminants
 - Section 22 on Contaminated Sites
 - Section 25 Authority for Regulations
 - Section 28 Minister can impose conditions on any authorization issued under the Act or Regulations
 - Section 29 Orders
 - Section 32 Fines : max for individual is \$10K; for Corp is \$50K

Regulations to Protect Groundwater

- Water Well Regulations
- Watercourse and Wetland Protection
- Petroleum Storage Tanks
- Waste Resource Management Regulations
- Missing
 - No Environmental Impact Assessment Regulations, which could help implement additional measures to protect groundwater from any type of development.

Strong Commitment to Enforcement Required

- For example under Section 6 of Water Well Regs GW exploration permit is req'd for 4 l/s (53 igpm) or greater
 - Does anyone monitor pumping of existing high capacity wells?
 - How many fines have been issued?
 - All high capacity wells should have flow meters, which are usually specified in a groundwater extraction permit.
 - Is there any monitoring or reporting required back to the Department or Enforcement Section?

Watershed Models

- There should be a watershed model for every watershed on PEI as this would enable the following:
 - Water budget to be prepared for each watershed.
 - Determination of water availability for any proposed undertaking.
- Proponents would still have to prove that the volume of water they are requesting is available at a safe yield with no significant impact on baseflow to streams* or to existing wells in the watershed, with real time monitoring.
- Mitigation of negative effects within watershed would have to be implemented

* Streams which flow year round

High Capacity Wells - Recommendation

- All applications could be channelled through an Environmental Impact Assessment process in addition to a groundwater exploration permit process
- Applicants would have to hire a certified hydrogeologist to conduct scientific assessment and they would have to sign off on amount of water which can sustainably be extracted.
- Applicants would pay the entire cost of these assessments with no cost to tax payers.
- Regulatory framework required

Appropriation of Water Usage

- Water should be allocated in order of priority.
 - Top priority would be water for human consumption and should trump all other uses.
 - Animal and fish consumption be next priority
 - Water for industrial use including irrigation of crops would be medium priority
 - Water for recreational use, swimming pools, watering of lawns, vehicle and street washing would be lower priority.
 - Water for sale or export would be lowest priority or possibly prohibited.

Groundwater Protection and Management

- Enhanced enforcement of existing legislative measures
- Watershed management models
- Planning for protection
 - A guide to Watershed Planning on PEI
 - Well protection tool kit or source water protection plans
- Well field protection and buffer zones

Watershed Approach

- A watershed by watershed approach is an effective management method for protection of groundwater
 - Watersheds would not be considered in the same manner as there are mitigating factors.
- Some watershed are already near or over capacity with regard to withdrawal rates (Winter River, Barbara Weit)
- Watershed groups could become water guardians to help protect source water and identify potential sources of contamination
- A water budget could be identified for each watershed.

Public Education

- The public need to be better informed about groundwater
- Water conservation needs to be addressed as a priority.
- There is a poor understanding of groundwater and how it flows underground.
- A hands on 3D model of a watershed, including groundwater flow systems could provide a hands on interactive system. (see www.enviroscares.com)

Storm Water Management

Considerations

- Storm water management is an important consideration in proper management of groundwater.
- Hard surfaces such as roofs, paved parking lots
 - Developers and governments need to understand that hard surfaces reduce recharge to groundwater and create overloads to watercourses
 - Each acre of hard surface results in approximately 5 million litres of additional runoff with no opportunity for groundwater recharge.
 - -Ditch infilling with piped runoff reduces opportunity for groundwater recharge.
- Culverts and Bridges need to properly sized for more intense rainfall and runoff events
 - Rainstorm on December 10, 2014 caused 50 bridge and culvert washouts

Culvert Washout Cornwall 2008



Some Storm Water Conservation Methods

- Town of Bridgewater, NS considering some storm water conservation measures
- Options to consider include:
 - Vegetative filter strips
 - Green roofs
 - Perforated pipes
 - Permeable pavement
 - Rainwater harvesting
 - Rain gardens
 - Small infiltration practises
 - Bio retention
 - Dry swales
 - Grass swales
 - Storm and sanitary sewer separation
 - Reduce or eliminate ditch infilling

Summary



- Protection of our groundwater is critical
- A new Water Act will be useless unless there is a commitment to enforcement
- Water use and allocation should be ranked in priority fashion.
- Conservation measures need to be implemented
- Education of the public and potential water users is essential
- Public engagement is necessary to protect this resource for future generations